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(54) PACKAGING MATERIAL AND CONTAINERS COMPRISING SUCH MATERIAL

(71) I, DAVID JULIAN STEINER, a British subject, of 125 Bridge Lane, London, N.W.11, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement: —

This invention relates to a packaging material and to containers, for example, envelopes, which comprise such material.

It is commonly desired to protect in transit articles which are fragile, frangible, brittle or otherwise susceptible to damage when subjected to conditions of shock and/or pressure. It is common practice to minimise such shock and/or pressure by at least partially surrounding the article with a material which is compressible and resilient. Preferably the material is of low density since, for example, the transit costs are thereby minimised. Suitable such materials include expanded plastics materials, for example, expanded polystyrene and expanded polyethylene.

The prior plastics materials which are suitable for protecting articles in transit have been available, for example, in sheet form or in moulded shapes. The sheet form of a compressible and resilient plastics material is particularly suitable when used in combination with a conventional sheet packaging material which is substantially non-compressible but which is relatively strong and which may comprise, for example, kraft or other papers. The two materials, sheet plastics material and conventional sheet packaging material, may be laminated and caused to adhere to each other with conventional adhesive or by other means. Such laminated materials are particularly useful in packaging generally and in the fabrication of envelopes, wrappers and the like.

However, the prior compressible and resilient plastics materials are not always satisfactory since, for example, they may possess only poor compressibility and/or resilience; these properties may diminish with use; and the plastics material or laminate may be expensive or difficult to produce.

I have now found that a particularly suitable and satisfactory packaging material, which may also mitigate at least some of the above disadvantages, comprises

(a) a substantially non-compressible conventional sheet packaging material, laminated with

(b) a compressible and resilient web comprising a foamed plastics material, said web comprising an arrangement of strands of a foamed plastics material wherein one series of substantially parallel strands of the material overlies another series of substantialy parallel strands of the material there being adherence at least at some of the points of contact between the overlying and underlying strands.

The conventional sheet packaging material may be selected from a wide range of materials which, preferably, are relatively strong and resistant to abrasion and to other forms of wear. Particularly suitable materials are of paper, for example bleached or unbleached kraft paper; or of plastics or other synthetic film, for example polyethylene film, cellulose acetate film, polyester film and nylon film. Other suitable material includes regenerated cellulose film. These materials may be coated, if necessary, with a wide range of coating materials, for example the paper may be coated with a plastics material such as polyethylene.

By a foamed plastics material I mean a resilient plastics material containing pockets from which air can be at least partially expressed on compression and

which can take up air when the material returns to its former shape. The foamed plastics material of which the compressible and resilient web is comprised may comprise polyethylene, polypropylene, polystyrene, and the like in any expanded form. Polyethylene is particularly suitable since it is cheap, of conveniently low melting point for manufacture of the web, and it is durable. The strands of foamed plastics material may be formed in conventional manner, for example by extrusion of a molten polyethylene which comprises a blowing agent; or by extrusion of a polymer into which air has been introduced by suitable means. The strands may be arranged in a web-like manner by a conventional technique, for example by extruding foamed polyethylene as a first series of strands from a first set of extrusion dies and by simultaneously extruding a second series of strands obliquely to the first series of strands from a second set of extrusion dies, the two series of strands being caused to make contact and to adhere before the polyethylene becomes non-self-adhesive.

The strands may be of any suitable cross-sectional shape or areas: thus the strands may be of approximately circular or square cross-section; the strands may not be linear but may be undulating in nature. The web may have the appearance of a woven material, but usually it will have a trellis-like appearance and the web may be extended by stretching in at least one direction. One or more further series of strands may overlie obliquely the two series of strands mentioned above so that the web then comprises three or more separate series of strands. In a preferred form of the web there is adherence at substantially all of the points of contact between the overlying and underlying strands.

The new packaging material of the invention may consist of one or more layers of the conventional sheet packaging material laminated with one or more layers of the web; for example, the material may comprise one layer of the web to which is laminated on one or on both sides of the web a sheet of a kraft or other paper. Lamination may be effected with a conventional adhesive.

My invention also provides a container which comprises a new packaging material of the type hereinbefore described. My invention further provides a container blank comprising a new packaging material of the type hereinbefore described which container blank is capable of being formed into a container.

By a container I mean any means for containing an article to be protected from shock and/or pressure wherein can be used the packaging material hereinbefore described. Suitable containers include for example envelopes, bags, wrappers and boxes and the invention includes such containers when assembled ready for use and when disassembled, for example as a blank. An envelope or wrapper may be formed from a flat sheet of the packaging material by suitable folding and adherence of specified opposing surfaces.

The packaging material of my invention is particularly suitable for the production of envelopes or wrappers. Such envelopes or wrappers preferably comprise two opposed sheets of the packing material so that an article to be protected lies between two layers of the web, each layer of web being laminated with a sheet of paper.

The envelopes or wrappers may be sealed by various means to imprison an article to be protected, for example by heat sealing, staples sealing, or by adhesive or other temporary security sealing. An envelope comprising a plastics film as the conventional sheet material may also be sealed by a closure comprising an external or internal captive flap.

WHAT I CLAIM IS: —

1. A packaging material which comprises (a) a substantially non-compressible conventional sheet packaging material, laminated with (b) a compressible and resilient web comprising a foamed plastics material, said web comprising an arrangement of strands of . foamed plastics material wherein one series of substantially parallel strands of the material overlies another series of substantially parallel strands of the material, there being adherence at least at some of the points of contact between the overlying and the underlying strands.

2. A packaging material according to claim 1 wherein (a) is of paper or of sheet plastics material.

3. A packaging material according to claim 1 or claim 2 wherein the foamed plastics material is foamed polyethylene.

4. A packaging material according to any one of claims 1-3 wherein the strands to foamed plastics material are approximately circular in cross-section.

5. A packaging material according to any one of claims 1-4 wherein (b) has a trellis-like appearance.

6. A packaging material according to claim 1 substantially as hereinbefore described.

7. A container which comprises a packaging material according to any one of claims 1-6.

8. A container according to claim 7 which is in the form of an envelope, bag, wrapper or box.

9. A container according to claim 7 substantially as hereinbefore described.

10. A container blank for use in making a container according to claim 7.

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